AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for searching multipaths of a mobile communication system, the method comprising:

performing a coherent detection on reversed I and Q channel signals of a Dedicated Physical Control Channel (DPCCH) transmitted from a remote mobile station, multiplying the detected signal by a pilot pattern to accumulate a pilot ~~symbol~~ information section in a corresponding section, and performing a coherent accumulation on another ~~symbol~~ information section ~~on a symbol by symbol basis~~;

calculating energy values for each coherently accumulated I and Q channel signals;

multiplying the calculated energy ~~value~~ values of the Q channel by a variable weight corresponding to the pilot ~~symbol~~ information section and the I channel by another variable weight corresponding to the ~~other symbol~~ another information section, respectively;

noncoherently accumulating the energy values multiplied by variable weights, and saving the energy values;

comparing the saved energy values with a periodically designated threshold; and

searching timing information in a number of fingers in order of highest to lowest energy values according to a comparison result.

2. (Currently Amended) The method of claim 1, wherein a total energy is searched by accumulating the pilot ~~symbol~~ information section of the DPCCH to the pilot symbol, by coherently accumulating the ~~other~~ another control ~~symbol~~ information section in ~~a symbol~~ an information unit, and by multiplying each accumulated ~~symbol~~ information section by different weights from each other.

3. (Currently Amended) The method of claim 1, wherein a number of the pilot ~~symbols~~ information of the DPCCH is multiplied by a first weight corresponding to the pilot ~~symbol~~ information section in a variable section, and by a second weight corresponding to the ~~other symbol~~ another information section.

4. (Currently Amended) The method of claim 2, wherein the number of the pilot ~~symbols~~ information of the DPCCH is variable, being arbitrarily selected from 3 through 8.

5. (Currently Amended) The method of claim 2, wherein the weight corresponding to a specific pilot ~~symbol~~ information section is ~~Pn over {Pn + 1}~~ Pn/(Pn + 1) and the weight corresponding to the ~~other symbol~~ another information section is ~~1 over {Pn+1}~~ 1/(Pn + 1), in which Pn is the number of the specific pilot ~~symbols~~ information of the DPCCH.

6. (Currently Amended) The method of claim 2, wherein the first weight to be multiplied by the pilot section of the DPCCH, and the second weight to be multiplied by the

~~other symbol~~ another information section complement each other, and the sum of the two weights is 1.

7. (Currently Amended) The method of claim 1, wherein the method is repeated based on a designated window size for multiplying the number of the pilot ~~symbols~~ information of the DPCCH and the ~~other~~ another control ~~symbols~~ information by variable weights, noncoherent accumulation, and storage in a search result storage.

8. (Currently Amended) An apparatus for searching multipaths of a mobile communication system, comprising:

a decimator for performing a decimation process on each channel signal inputted in a predetermined sample rate;

an input buffer for saving every output of the decimator;

a complex despreader for despreading the outputs from the input buffer into complex signals using a scrambling code signal generated by a scramble control signal;

a coherent accumulator for coherently accumulating a multiplication of the despread output and a pilot signal based on a pilot ~~symbol~~ information section and another control ~~symbol~~ information section;

an energy calculator for calculating an energy value of a Dedicated Physical Control Channel (DPCCH) using a coherent accumulation signal;

a multiplier for multiplying a pilot section of the DPCCH and the ~~other~~ another control ~~symbol~~ information section by an appropriate weight, respectively;

a noncoherent accumulator for noncoherently accumulating an output of the multiplier;

a search result storage for sequentially storing an output of the noncoherent accumulator in a sequence relative to the energy value; and

a digital signal processor for outputting a control signal to generate the scrambling code, for outputting different weights according to a pilot ~~symbol~~ information of the DPCCH, and for periodically storing the energy value in the search result storage.

9. (Currently Amended) The apparatus of claim 8, wherein the coherent accumulator accumulates the pilot ~~symbol~~ information section of the DPCCH to the pilot ~~symbol~~ information, and coherently accumulates the ~~other~~ another control ~~symbol~~ information section except for the pilot ~~symbol~~ information in ~~a symbol~~ an information unit.

10. (Currently Amended) The apparatus of claim 8, wherein a number of the pilot ~~symbols~~ information of the DPCCH is variable, being arbitrarily selected from 3 through 8.

11. (Currently Amended) The apparatus of claim 8, wherein the multiplier multiplies the pilot ~~symbol~~ information section in a variable section of the number of pilot ~~symbols~~ information of the DPCCH by a first weight transmitted from the digital signal processor, and

the ~~other symbol~~ another information section by a second weight transmitted from the digital signal processor.

12. (Currently Amended) The apparatus of claim 8, wherein the weight corresponding to a specific pilot ~~symbol~~ information section is ~~Pn over {Pn + 1}~~ Pn/(Pn + 1), and the weight corresponding to the ~~other symbol~~ another information section is ~~1 over {Pn +1}~~1/(Pn + 1), in which Pn is the number of the specific pilot ~~symbols~~ information of the DPCCH.

13. (Currently Amended) The apparatus of claim 8, wherein the multiplier multiplies the pilot section of the DPCCH by a first weight, and the ~~other symbol~~ another information section by a second weight, the two weights being complements to each other and the sum of the two weights being 1.

14. (Currently Amended) A method for searching multipaths of a mobile communication system, the method comprising:

decimating I and Q channel signals of a Dedicated Physical Channel (DPCH) transmitted from a remote mobile station, storing the decimated I and Q channel signals in an input buffer, respectively, and despreading the channel signals using a scrambling code signal;

calculating an energy value of a Dedicated Physical Data Channel (DPDCH) by multiplying the despread channel signals by a pilot pattern, coherently accumulating the

multiplication outputs, calculating an energy value of the Dedicated Physical Control Channel (DPCCH), dechannelizing the despread channel signal using an orthogonal variable spreading factor (OVSF), and coherently accumulating the dechannelized code;

noncoherently accumulating the energy values of the DPCCH and the DPDCH, and multiplying each channel energy value by different channel weights according to a spreading factor of the DPDCH;

adding the channel energy values multiplied by different channel weights together, sequentially storing the sum, and periodically comparing the stored channel energy values with a designated threshold; and

sending out a channel energy value greater than the threshold to a sort block, and searching timing information in order of high to low energy values, the number of channel energy values being equal to a number of fingers.

15. (Previously Presented) The method of claim 14, wherein the channel weight comprises a first channel weight corresponding to a spreading factor of the DPCH of the DPCCH that is noncoherently accumulated, and a second channel weight corresponding to a spreading factor of the DPDCH of the DPCH that is noncoherently accumulated.

16. (Currently Amended) The method of claim 15, wherein if the spreading factor (SF_k) of the DPDCH varies from 4 through 256, and ~~satisfies 256 over 2^k (k=0~6)~~ the spreading factor (SF_k) = $256(2^k)$,where k ranges from 0 to 6, then the first channel weight (Wc)

corresponding to the spreading factor (SF_k) of the DPDCH is ~~any value satisfying a formula, {1} over [{256 over SF_k} + 1]~~ 1/((256/SF_k) + 1), and [[a]] the second channel weight (Wd) is ~~any value satisfying a formula, {256 over SF_k } over [{256 over SF_k } +1]~~ (256/SF_k)/((256/SF_k)+1).

17. (Original) The method of claim 15, wherein the first weight to be multiplied by the spreading factor of the DPDCH, and the second weight to be multiplied by the energy of the DPDCH complement each other, and the sum of the two weights is 1.

18. (Currently Amended) An apparatus for searching multipaths of a mobile communication system, comprising:

a decimator for receiving a Dedicated Physical Channel (DPCH) signal from a remote mobile station, for filtering off the signal, and decimating I and Q channel signals at a designated ratio, the signals being inputted at a predetermined sample rate;

an input buffer for storing an output of the decimator;

a complex despreader for despreading the channel signal saved in the input buffer using a scrambling code signal under the direction of a scrambling code signal generated by a scrambling code control signal;

a first channel energy searcher for searching a first channel Dedicated Physical Control Channel (DPCCH) energy by multiplying the despread output by a pilot signal and coherently accumulating the multiplication output;

a second channel energy searcher for searching a second channel Dedicated Physical Control Channel (DPCCH) energy by dechannelizing output of the complex despreader using an orthogonal variable spreading factor (OVSF), by coherently accumulating the output to calculate the energy, and by noncoherently accumulating the calculated energy;

a first multiplier for multiplying the output of the noncoherent accumulation of the first channel energy searcher by a first channel weight;

a second multiplier for multiplying the noncoherently accumulated first channel energy of the second channel energy searcher by a second channel weight;

an adder for adding up the output of the first multiplier and the output of the second multiplier;

a search result storage for storing a total value of the adder; and

a digital signal processor for outputting different channel weights according to a spreading factor of the DPDCH, for periodically storing the energy values saved in the search result storage[[;]], for comparing the stored search value with a threshold, and if the energy value is greater than the threshold, searching for timing information in order of high to low energy values, the number of energy values being equal to a number of fingers.

19. (Previously Presented) The apparatus of claim 18, wherein the first channel energy searcher comprises:

a first and a second coherent accumulator;

a first energy calculator for calculating an energy value of the DPCCH based on a coherently accumulated signal by the first and the second coherent accumulators; and

a first noncoherent accumulator for noncoherently accumulating an output of the energy calculator.

20. (Currently Amended) The apparatus of claim 18, wherein the second channel energy searcher comprises:

third and fourth multipliers for dechannelizing the despread signals by the complex despreader by multiplying the signal by the OVSF code to distinguish the channel;

first and second coherent accumulators for coherently accumulating output of the third and the fourth multipliers, respectively;

a first energy calculator for calculating an energy value of the DPDCH out of the coherent accumulation signal; and

a first noncoherent accumulator for noncoherently accumulating an output of the ~~second~~ first energy calculator.

21. (Currently Amended) The apparatus of claim 18, wherein the digital signal processor has a first channel weight and a second channel weight according to [[a]] the spreading factor of the DPDCH, the two weights being complements to each other and sum of the two being 1, and the digital signal processor outputs the weights to [[a]] the first multiplier and [[a]] the second multiplier, respectively.

22. (Currently Amended) The apparatus of claim 21, wherein if the spreading factor (SF_k) of the digital signal processor varies from 4 through 256, and ~~satisfies 256 over 2^k (k=0~6)~~the spreading factor (SF_k) = $256(2^k)$, where k ranges from 0 to 6, ~~and~~ then the digital signal processor outputs the first channel weight (Wc) corresponding to the spreading factor (SF_k) of the DPDCH as ~~{256 over SF_k} over [{256 over SF_k} +1]~~ $(256/SF_k)/((256/SF_k)+1)$, and the digital signal processor outputs the second channel weight (Wd) as ~~{1} over [{256 over SF_k} + 1],~~ $1/((256/SF_k)+1)$.

23. (Currently Amended) A method for searching multipaths of a mobile communication station, comprising:

a1) searching multipaths of a remote mobile station by providing different weights to a pilot ~~symbol~~ information section and another control ~~symbol~~ information section of a Dedicated Physical Control Channel (DPCCH), respectively, when a spreading factor of a reverse Dedicated Physical Data Channel (DPDCH) transmitted from a mobile station is not known; and

b1) searching multipaths of the mobile station by multiplying an energy value of the DPCCH and an energy value of the DPDCH by different weights that correspond to a spread factor of the DPDCH, respectively, thereby obtaining a total energy when the spreading factor of the reverse DPDCH transmitted from the mobile station is known.